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PROBLEMS COVERED BY CONFERENCE

(Title of Sessions)

- A. Principles of designing materials and coatings for operation in hazard conditions.**
- B. Scientific fundamentals and computer models for the processes of manufacturing materials and coatings for operation in hazard conditions.**
- C. Advanced technologies for production and joining materials and products for operation in hazard conditions.**
- D. Structure and properties of materials and coatings for operation in hazard conditions.**
- E. Special Session “Thermal Barrier Coatings”.**
- F. Experimental data obtained from performance of materials and coatings in on location hazard conditions.**
- G. Potential and contemporary technologies for recycling industrial waste aimed to production structural, heat-insulative, facing and other materials.**
- H. Scientific, organization and information problems of cooperation between scientists in the field of materials science.**
- I. Round Table “Effective transfer of technology is catalyst of society innovation development”.**

GENERAL INFORMATION

Crimean Conferences will be hold in seventh time with these topics. Conferences in Crimea concentrate attention of participants on one of the most important fields of materials science, namely, science and technology of materials (including nano- and “smart”) for hazard conditions service: high and cryogenic temperatures, aggressive environments, complex and

The discussions on the problems concerning ecology, recycling production waste and material that exhausted their resources are of great scientific and practical importance. The actuality of proposed problems for discussion is confirmed by the fact that more than 250 specialists too participation in each previous conferences. The Organizing Committee believes that the number of conference participants will increase in 2012, and the time for conference holding the “velvet” season in Crimea - will promote the successful work of conference. The temperature of air that season is +23–26 °C and sea water +20–22 °C.

The Conference will take place and participants be accommodated at House of Scientists of NASU that is located in settlement Katsiveli at the very beach of Black Sea. At this center there are rooms equipped with balconies, TV, refrigerators. You may spend free time at excellent beach equipped with chaise-longues and tents. The conference participants will have three meals a day.

The pension has one-bed and two-beds comfortable rooms. The full financial information about conference participation will be presented in the second announcement. Approximate accommodation is about \$60–65. Tentatively the conference fee will be €300. The discount will be offered for students and post-graduates.

The conference participants can reach conference place from the capital of Crimea – Sympheropol city by bus or taxi. This town has International airport. Travel time to House of Scientists of NASU is about 100–110 min.

REGULATION OF CONFERENCE

The conference will be organized as sessions. Plenary session will be held at the first day of conference, and it will be devoted to both problematic and survey presentations selected by Organizing Committee. So the participants are requested to inform if they intend to make such presentation. The participants are requested to choose the session title and point out it in the information attached to submission, and also kind of presentation, which is preferred – oral or poster. The topics of round tables are not covered by list of scientific areas in this announcement, they also could be proposed by participants. The official languages of conference will be Russian and English.

Abstracts up to one page prepared in accordance with Instruction will be published as an English version and disseminated among participants before conferences start.

IMPORTANT DEADLINES

Submission of abstracts	–15.05.2012
Dissemination of second information issue	–30.06.2012
Fee payment	from 01.07 till 01.09.2012

Information about the Conference will be published at the following web-sites
www.inmc.kiev.ua www.umre.kiev.ua

INFORMATION ABOUT AUTHORS

Title:

Optoelectronic temperature sensors based on Ge-As-Se chalcogenide glassy semiconductors for operation in radiation-hazard conditions

Index of session:

D. Structure and properties of materials and coatings for operation in hazard conditions.

Form of report:

Oral

Poster X

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OPTOELECTRONIC TEMPERATURE SENSORS BASED ON Ge-As-Se CHALCOGENIDE GLASSY SEMICONDUCTORS FOR OPERATION IN RADIATION-HAZARD CONDITIONS

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Environment optoelectronic sensors based on optical fibers are known to be one of the most perspective sensing devices revealed a number of essential advantages over known counterparts, such as immunity to electromagnetic interference, lightweight, small size, high sensitivity, large bandwidth and ease in implementing multiplexed or distributed sensors, etc. Temperature, pressure and mechanical strains are most widely control parameters measured with fiber-based optical sensors (FBOS). But despite achieved progress in the last years, the development of high-reliable FBOS capable to work in the hazard radiation environment is an actual problem up to now. Mechanical stress measurements for structural integrity monitoring of reactor containment buildings, chemical control of nuclear waste tanks and radiation monitoring of geological waste disposals are only few examples of such industrial applications related to environmentally-hazard extreme conditions.

The temperature T-monitoring within nuclear reactors is one of the most promising areas, where FBOS can be successfully used alternatively to conventional sensing devices such as Pt-resistance thermometers. This sensor contains a semiconductor crystal (T-sensitive functional element) like to GaAs coated with a dielectric mirror, the both elements being epoxyied to the fiber tip. The fiber made of pure silica glass is used as optical waveguard, the whole construction being protected and mechanically strengthened with Teflon tubing. The main operation principle

of this T-measuring FBOS is grounded on a well-known negative temperature coefficient dependence of semiconductor bandgap: the measuring of fundamental optical absorption edge position yields the environment temperature.

However, this kind of T-measuring FBOS is hardly operated in the hazard radiation conditions because of accompanied radiation-induced structural damages hid the real value of pure T-related effect. Thus, in crystalline GaAs, the fundamental optical absorption edge depends on both radiation defects and ambient temperature in a too complicated manner to provide reliable T-measurements. This important problem can be successfully resolved by corresponding choice of T-sensitive functional semiconductor element possessing a great T-induced shift of fundamental optical absorption edge combined with relatively small or even negligible under-margin radiation sensitivity.

In this work we report on the possibility of application of chalcogenide glassy semiconductors of Ge-As-Se family as active media for T-measuring FBOS. Temperature and radiation-induced changes of optical transmission in the fundamental optical absorption edge region was studied. Quasi-linear temperature dependences of the optical characteristics were observed through the whole investigated range of temperatures (from the room temperature to the glass transition temperature). Additionally, negligible radiation-induced changes were recorded.